

### **REMARKS**

Claims 1-12 are pending in this application. Claim 6 has been amended. New claim 12 has been added. The amendment to claim 6 is supported by the specification at, for example, paragraph [0014]. Support for new claim 12 appears, for example, in original claim 1.

#### **1. § 112 Rejections**

The Examiner rejected claims 3-5 under 35 U.S.C. 112, second paragraph as being indefinite in the use of the units "psi-s/inch". Applicants respectfully traverse this rejection.

Claim 3 recites a wall-drag coefficient ( $\beta$ ) having units psi-s/inch. Applicants clarify that in this expression, psi and seconds (abbreviated "s") appear in the numerator, and inch appears in the denominator.

The units for the wall-drag coefficient can be derived from the disclosed relationship in numbered paragraph [0039] of the specification. Specifically, the wall-drag coefficient has the units of "stress" divided by "velocity" (see, e.g., equation (5)). Stress has units of "force/area" and velocity has units of "distance/time." Thus, according to equation (5), the wall-drag coefficient has units of "force multiplied by time divided by length." No correction is deemed necessary.

Reconsideration and withdrawal of the rejection are respectfully requested.

#### **2. First § 103 Rejection**

The Examiner rejected claims 1 and 2 under 35 U.S.C. 103(a) as obvious over Ohashi (US 5,514,347). Applicants respectfully traverse this rejection.

The invention of claims 1 and 2 relates to a method for making an extruded metal honeycomb article. The method as recited in claim 1 comprises, in pertinent part, heating a metal feed stock to a temperature effective to provide a softened bulk metal feed charge, and forcing the bulk metal feed charge into and through an array of feedholes.

Ohashi discloses a method of manufacturing an extruded-type honeycomb structure made of a metal. However, according to the method of Ohashi, the honeycomb structure is formed by extruding a powder material (see, e.g., column 7, lines 17-23 and column 9, lines 14-21). In each of the extruded-type honeycomb examples disclosed by Ohashi, a powder mixture is prepared and extruded through an extrusion die (see, e.g., column 12, lines 30-43). Ohashi's use of a powdered metal to form a honeycomb structure was acknowledged in the Office Action.

Ohashi does not disclose or suggest forming a honeycomb structure by heating a metal feed stock to provide a softened bulk metal feed charge, much less forcing the bulk metal feed charge into and through an array of feedholes. A softened bulk metal feed charge, as recited by claim 1, cannot be equated to the powder material or powder mixture taught by Ohashi.

Because Ohashi fails to disclose or suggest all of the elements and steps recited by claim 1, Applicants respectfully submit that claim 1 is patentable over Ohashi. Based on its dependency from claim 1, claim 2 is also deemed patentable. Moreover, Ohashi discloses forming the through holes by machining or drilling (see, e.g., column 7, lines 17-23 and column 10, lines 14-21). In contrast, claim 2 refers to features of a honeycomb extrusion die. The Ohashi disclosure of forming through holes does not correspond to the extrusion die features in claim 2. Reconsideration and withdrawal of the rejection are respectfully requested.

### **3. Second § 103 Rejection**

The Examiner rejects claims 3-5 under 35 U.S.C. 103(a) as obvious over Ohashi in view of Peters (US 4,574,459). Applicants respectfully traverse this rejection.

Claims 3-5 each depend either directly or indirectly from claim 1. At least for the reasons cited above, Ohashi fails to disclose or suggest all of the claim 1 limitations.

Peters relates to a method of forming a die and specifically to forming coatings on slot-defining surfaces of a die. Peters does not, however, teach to provide a softened

bulk metal feed charge much less a step of forcing a bulk metal feed charge through a die. Thus, Peters fails to remedy the deficiencies of Ohashi. For at least this reason, reconsideration and withdrawal of the rejection are respectfully requested.

#### **4. Third § 103 Rejection**

The Examiner rejects claims 6-11 under 35 U.S.C. 103(a) as obvious over Ohashi. Applicants respectfully traverse this rejection.

The Examiner stated that Ohashi indicates that the sum of the open area of the through holes relative to the total surface area of the walls in the Ohashi structure is a minimum of 5%, as opposed to the porosity below 5% by volume of claim 6. The Examiner concluded that no patentable distinction would exist between a structure having a porosity of 5% and one having a porosity just below this value.

The Examiner's comparison of the cited Ohashi data to the porosity value in claim 6 does not appear to be appropriate. The extruded metal honeycomb of claim 6 is formed of a bulk metal having a porosity below 5% by volume. In contrast, the through holes disclosed in Ohashi are machined open spaces in the partition walls having a sum of the open areas ranging from 5% to 35% of the total surface area of the partition walls. This does not relate to the 5% porosity by volume of the bulk metal mentioned in claim 6.

Although Ohashi discloses the honeycomb structure may or may not be porous (see column 8, line 8), it is not clear which embodiment this statement refers to. For instance, Ohashi discloses a honeycomb substrate comprising a corrugated thin metal foil, as well as a structure having a unitary structure formed by sintering an extruded body comprising a powder material (see column 3, lines 1-4). The honeycomb structure may also be made of a ceramic as well as a metal (see column 7, lines 58-61). Moreover, when creating a honeycomb structure by the extrusion of a metal powder at col. 12, lns 53-54, Ohashi reports a porosity of about 22%, compared to the less than 5% by volume porosity of claim 6. Lastly, claim 6 has been amended to indicate that the channel walls have a thickness of about 0.001-0.1 inches from the first end face to

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the second end face of the body. Ohashi intentionally provides "through holes" within its disclosed partition walls, rather than disclosing walls having a claimed thickness from one end to the other end of the honeycomb. For at least these reasons, the rejection of claims 6-11 should be withdrawn.

Based upon the above amendments, remarks, and papers of records, applicant believes the pending claims of the above-captioned application are in allowable form and patentable over the prior art of record. Applicant respectfully requests that a timely Notice of Allowance be issued in this case.

Applicant authorizes the Office to charge any necessary fee or surcharge with respect to said time extension to the deposit account of the undersigned firm of attorneys, Deposit Account 03-3325.

Please direct any questions or comments to Steven J. Scott at 607-974-3322.

Respectfully Submitted,

DATE: Nov. 12 2008



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